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Allis-Chalmers Company

Bulletin Mining Machinery Department

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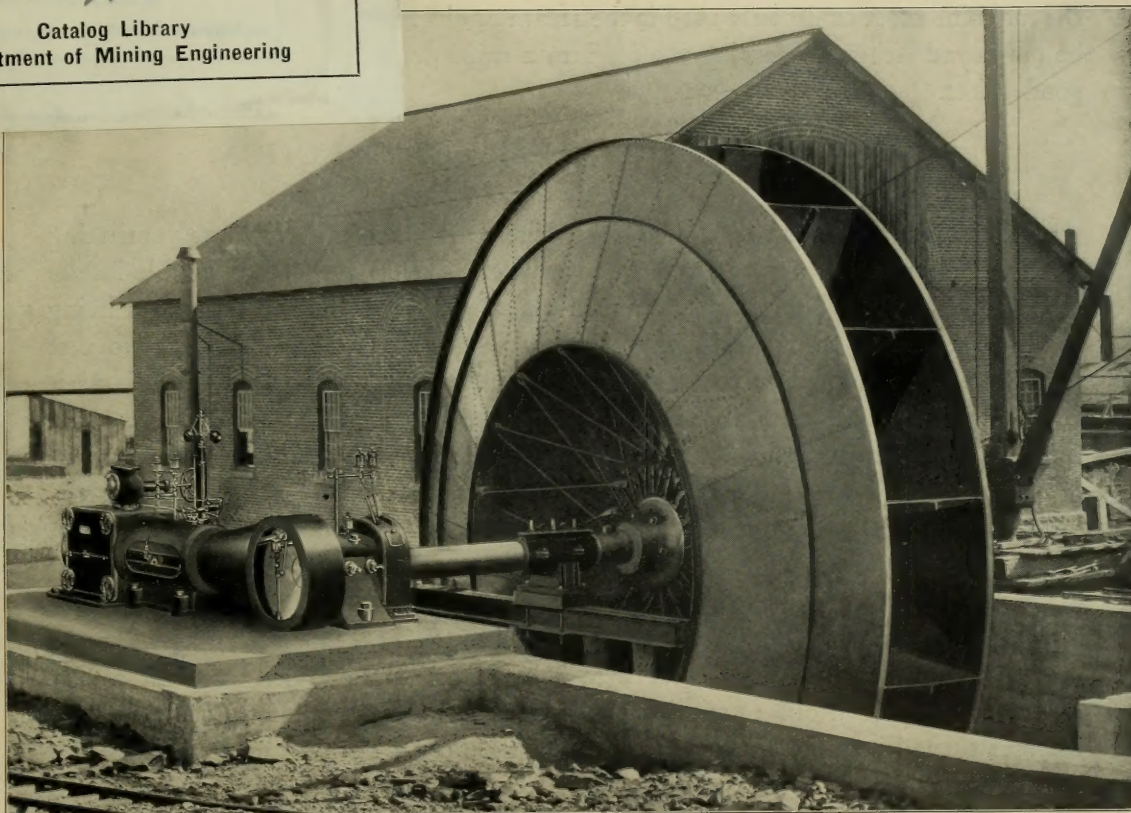
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ers Steel Ventilating Fans.



Specially designed 35-ft. Fan, with taper blades, showing connection to Reynolds-Corliss Engine.

Allis-Chalmers Ventilating Fans.

THE VENTILATION OF MINES.

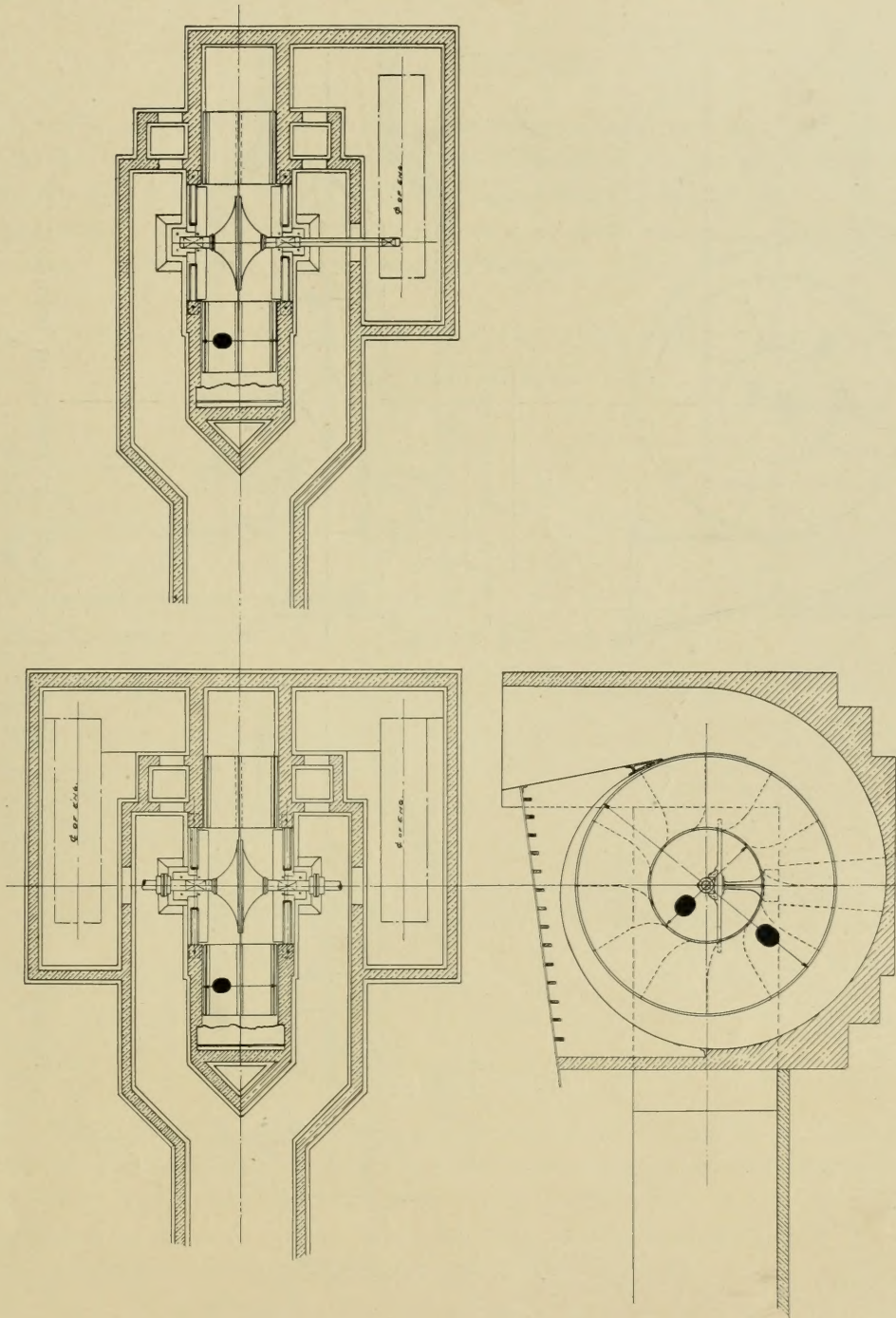
The use of ventilating apparatus for mining work has probably reached its highest development in collieries, where the large quantities of gas given off by coal compels the most careful attention to this subject. For ordinary purposes the machine most commonly used is the steam or electrically driven fan, which may be employed either for forcing the air into a mine or drawing it out, with equally good effect.

OUR STEEL FANS—THEIR CONSTRUCTION.

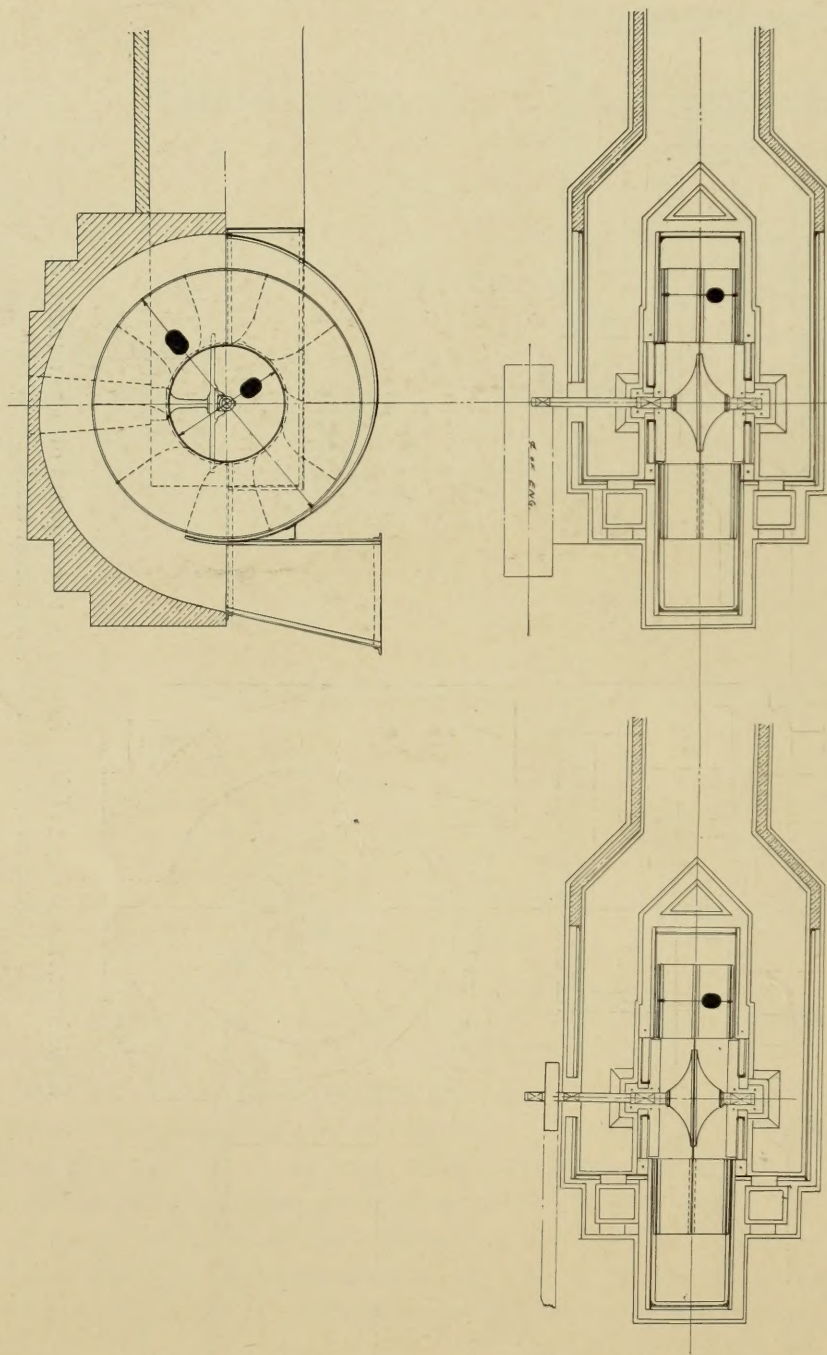
This Company, for some years past, has made a specialty of large ventilating fans with diameters varying from 12 to 35 feet. These are of the double-intake center draft type. They are built up of sheet steel and angles, the blades being rigidly fastened to sheet steel arms, which are in turn clamped between two cast iron centers, so shaped as to present the least possible resistance to the air as it enters the fan; the blades are also well braced to insure their running true. The sides of these fans are enclosed, from the periphery of the intake to the periphery of the outside or tip of blades, by steel plates reinforced by angle rings on the outside, and by angles on the sides of the blades on the inside.

This construction not only insures a strong, rigid fan for heavy duty, but it prevents all loss of air due to clearance between the fan and the side of the housing, and also reduces the friction for the same reason. The fan is usually mounted upon a hammered iron shaft secured to it by heavy keys. Then large set collars in halves are placed one upon either side against the fan centers and clamped in recesses turned into the shaft; these prevent the fan from working upon the shaft. A bronze bushed water jacketed bearing is placed upon either side of the fan, and these bearings, braced by suitable columns, are supported on long sole plates, the ends of which rest on the foundation and are securely bolted to it.

MINING MACHINERY DEPARTMENT



Showing arrangement of fans for one or two engines direct connected.
Cement, brick and sheet steel casing.



Showing arrangement of fan direct connected to engine or belted.
Cement and sheet iron or steel casing.

MINING MACHINERY DEPARTMENT

EFFICIENCY.

The efficiency of one of these fans under normal working conditions may be shown by a test conducted at the Henry Colliery, of the Lehigh Valley Coal Company, Wilkes Barre, Pa. This fan was guaranteed to deliver 300,000 cu. ft. of air per minute under a depression equivalent to three inches of water at about 75 r. p. m. The results obtained were as follows:

TEST OF 28 FOOT FAN, "HENRY COLLIERY," L. V. C. CO., WILKES BARRE, PA.

Outer diameter of fan	28' 0"
Inner " " "	12' 6"
Length of blades	7' 9"
Width " "	7' 8"
Expansion of Casing at cut-off	6' 6"
Double intake area of fan, $2 (.7854 \times 12.5^2) = 245.4$ sq. ft.	
Fan Drift { East side, area, 120 sq. ft.	} Total area, 241 sq. ft.
{ West side, " , 121 " " }	
Shaft 12 x 12, area 144 sq. ft.	

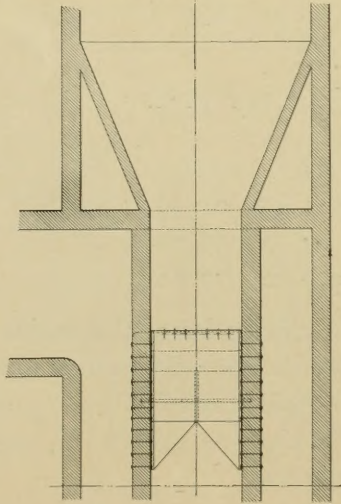
Single Corliss Engine, Size, 24" x 48",
Direct Connected.

Explosion doors arranged to give a 3-inch W. G. at 75 r. p. m.

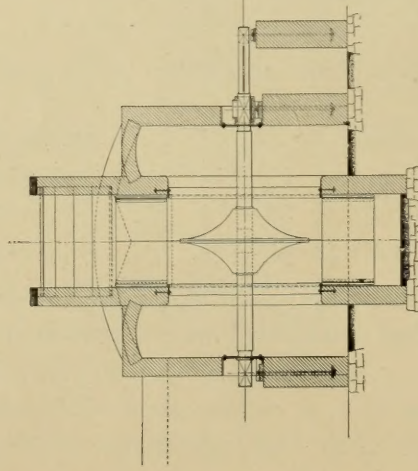
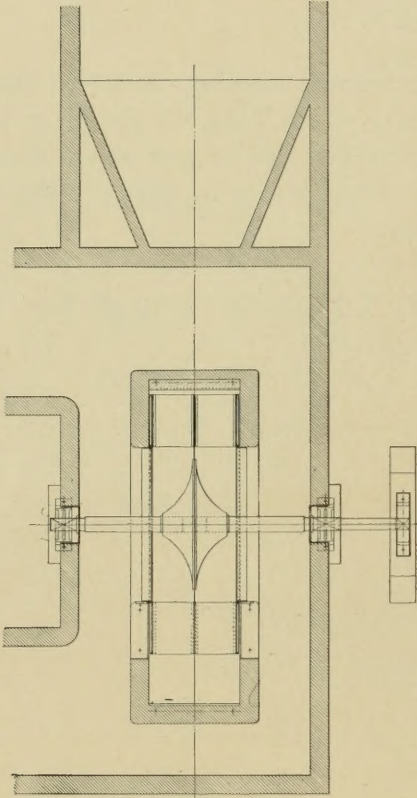
Speed R.P.M.	W. G. Inches	Quantity Cu. Ft.	H.P. on Air	I.H.P.	Efficiency	Barom. In.	Temp. Fhr.
25	.4	150,000	9.454	15.45	61.19	29.36	48
50	1.2	292,000	55.214	93.72	58.90	"	"
75	3.0	476,000	225.020	317.80	70.80	29.37	50

The efficiencies given above are the combined efficiencies of the engine and the fan, which materially lowers the result at these speeds below the normal working speed (75 r. p. m.) because of the increased friction ratio. Assuming 90% engine efficiency at 75 r. p. m. the power delivered to the fan was 286 H. P., making the efficiency of the fan alone at this speed 78.67 per cent.

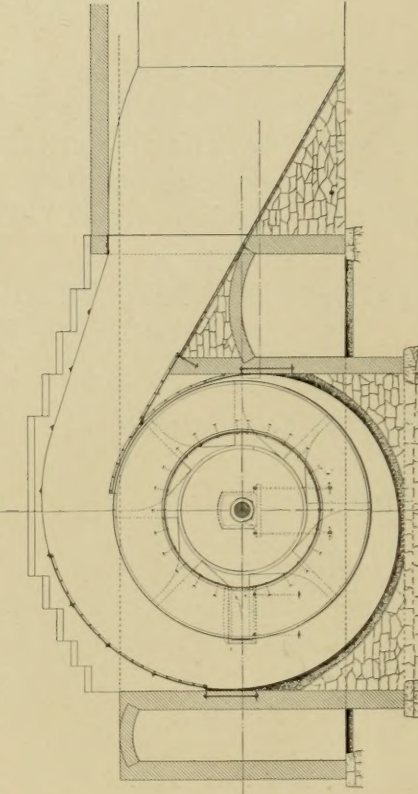
Plan of V Shutter.



Horizontal Section.



Vertical Cross Section at Center Line of Fan.

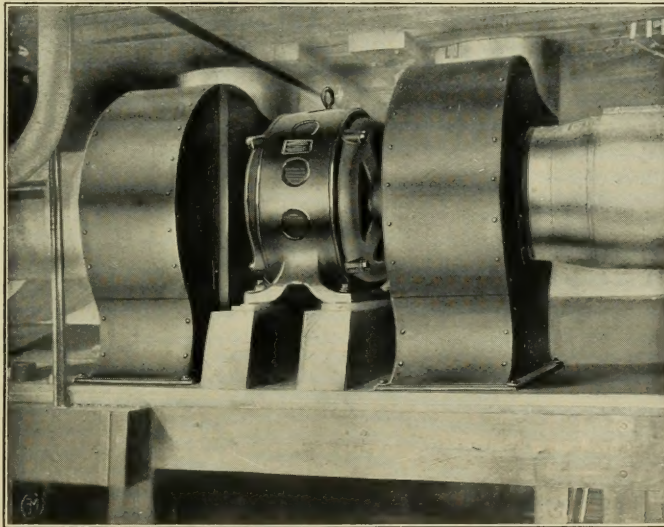


Vertical Longitudinal Section on Center Line.

20-ft. Allis-Chalmers Steel Ventilating Fan, built for the American Smelting & Refining Co.
Showing method of installation.

CONNECTION TO MOTIVE POWER.

These fans may be arranged for direct connection to the motive power or provided with pulleys for belting, depending upon the conditions of service, but in either case the apparatus is made exceptionally compact and combines maximum efficiency and durability with minimum bulk and weight. When the fans are required to be placed in damp and dirty passages, the direct connected unit has many advantages, for the use of belting under such conditions is far from desirable. The limited space available in such cases is also another argument in favor of this arrangement. Our fans may be driven either by small Allis-Chalmers "Reliance" Corliss engines or by Allis-Chalmers motors—preferably induction motors, where alternating current can be supplied.



Allis-Chalmers Induction Motor
Direct-connected to small Double Exhaust Fan.

THE VENTILATION OF METALLIFEROUS MINES.

While the explosive gases which are so common to collieries have made it essential for proper ventilation, it is too often true that very little attention is paid to this matter in metal-yielding mines until it is forced into prominence by the dimness of the lights or the hanging of powder smoke. No mine, however, can be regarded as well equipped unless the conditions under which the men labor are made as favorable as possible, and the use of simple, effective ventilating apparatus has of late years been greatly extended. Its importance is particularly felt during the opening of new shafts and especially where the rock formation is such that poisonous gases are given out from the fresh workings.

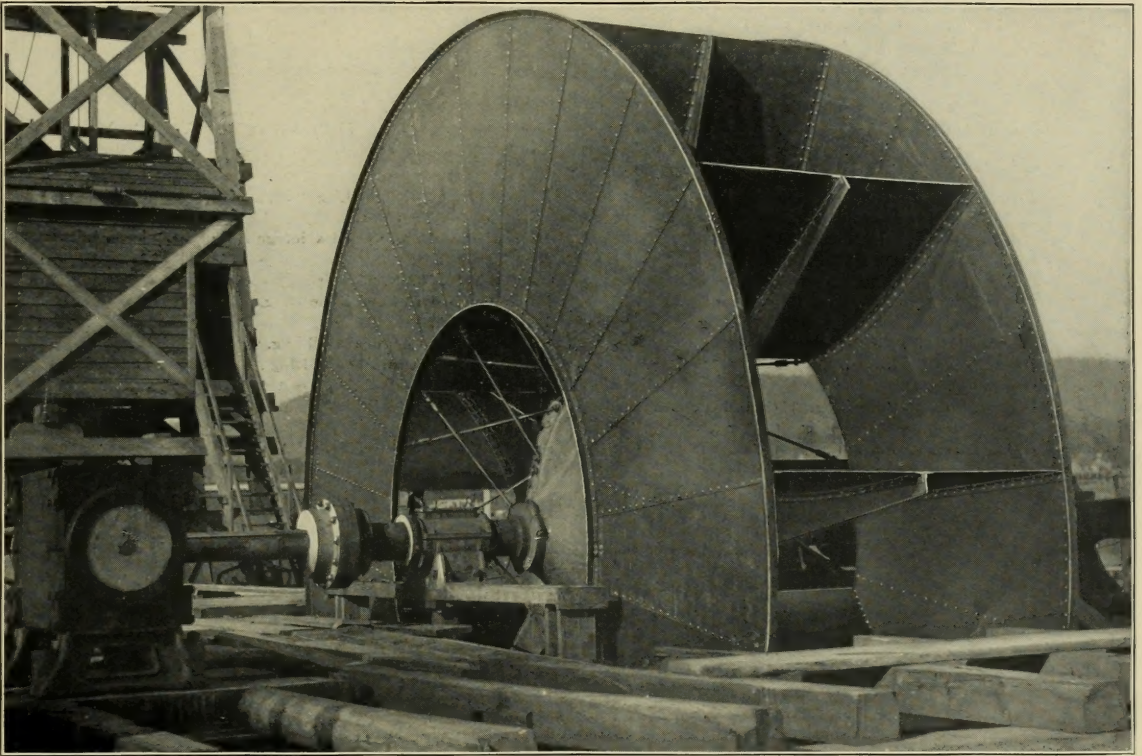
FOR HANDLING HOT GASES AND VAPORS.

These units are also adapted for use as waste heat fans, as in coal working plants or for handling hot gases in connection with smelting, refining and other work of the kind. In such cases the bearings of the fans are water jacketed, so that a continuous stream of water may be made to pass through the bottom shell when necessary; the oil boxes are so placed as to be beyond the reach of the heat.

VENTILATION OF FOUNDRIES, ROLLING MILLS, ETC.

The use of fans for ventilating foundries, rolling mills and shops of various kinds where the atmosphere becomes heavily charged with gases, vapors and other impurities, is too common to require extended mention. It is a fact, however, that very expensive apparatus is often used for these purposes where the simple motor driven fan, with ample intake and discharge, will give as good or better results. We shall be pleased to hear from any one who contemplates installing large ventilating apparatus of any kind and to advise him whether or not our fans are well adapted to his purpose. In case they are not, we shall not recommend them.

MINING MACHINERY DEPARTMENT



Standard Allis-Chalmers 28 ft. Steel Ventilating Fan in process of erection.
Duplicate of the one tested as described in this bulletin.

ALLIS-CHALMERS COMPANY

Allis-Chalmers Company

General Offices - - Milwaukee, Wis.

WORKS

Milwaukee:

Reliance Works:

Flour Mill and Saw Mill Machinery,
Power Transmission Machinery.

West Allis Works:

Steam Engines, Hoisting Engines, Blowing
Engines, Pumping Engines, Steam and
Hydraulic Turbines.

Chicago:

Works No. 1:

Crushing and Cement Machinery.

Works No. 2:

Mining Machinery.

Scranton, Pa.:

Scranton Works:

Power and Mining Machinery.

Cincinnati, Ohio: Electrical Works.

Executive Offices - - - - - 71 Broadway, New York, N. Y.

DISTRICT OFFICES

Atlanta, Ga., Fourth Nat'l Bank Bldg.

Baltimore, Md., Continental Bldg.

Boston, Mass., State Mutual Bldg.

Buffalo, N. Y., Ellicott Square Bldg.

Butte, Mont., 51 East Broadway.

Chicago, Ill., First National Bank Bldg.

Cincinnati, O., First National Bank Bldg.

Cleveland, Ohio, New England Bldg.

Dallas, Texas, Wilson Bldg.

Deadwood, S. D.

Denver, Col., McPhee Bldg., 17th and Glenarm Sts.

Detroit, Mich., 800 Union Trust Bldg.

El Paso, Texas, Guaranty Trust Bldg.

Kansas City Mo., The Dwight Bldg. cor. Baltimore
Ave. and Tenth St.

Minneapolis, Minn., Corn Exchange Bldg.

New York, 71 Broadway.

Omaha, Neb., 502 N. 25th St.

Philadelphia, Pa., Land Title Bldg.

Pittsburg, Pa., Frick Bldg.

St. Louis, Mo., Chemical Building.

Salt Lake City, Utah, Dooly Bldg., 117-119 W. 2nd
South St.

San Francisco, Cal., Rialto Bldg.

Scranton, Pa.

Seattle, Wash., 316 Occidental Ave.

FOREIGN SALES OFFICES

London, 533 Salisbury House, Finsbury Circus, E. C.

Johannesburg, South Africa, The Corner House

CANADA

Allis-Chalmers-Bullock, Ltd.: Works, Montreal, Que.

Offices

Montreal, Que.—Allis-Chalmers-Bullock, Ltd., Sovereign Bank Bldg.

New Glasgow, N. S.—Allis-Chalmers-Bullock, Ltd.

Nelson, B. C.—Allis Chalmers-Bullock, Ltd., Main St.

Toronto, Ont.—Allis-Chalmers-Bullock, Ltd., McKinnon Bldg.

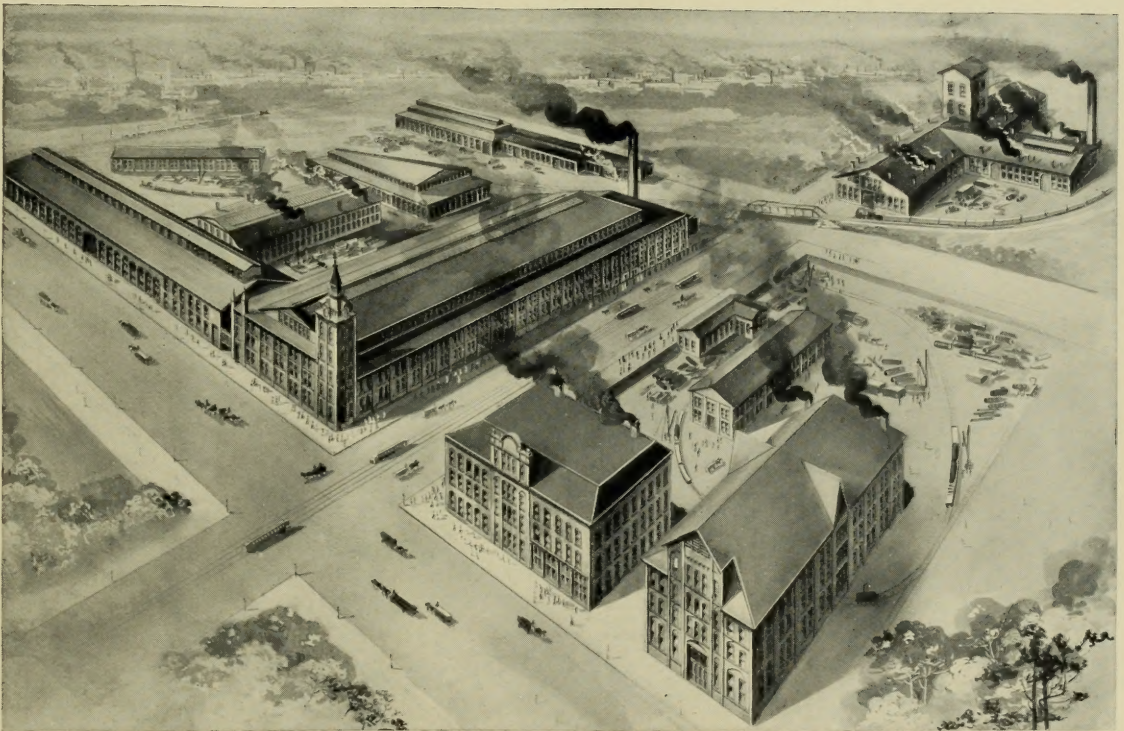
Vancouver, B. C.—Allis-Chalmers-Bullock, Ltd., 416 Seymour St.

Winnipeg, Manitoba—Allis-Chalmers-Bullock, Ltd., Canada Life Bldg.

FOREIGN SALES AGENCIES

Auckland, New Zealand,	.	.	.	.	.	John Chalmers & Son, Ltd.
Johannesburg, South Africa,	.	.	.	.	.	Herbert Ainsworth (for Rock Crushers Only)
Lima, Peru,	.	.	.	.	.	Henry Guyer
Manila, P. I.,	.	.	.	.	.	Bryan-Landon Co.
Perth, West Australia	.	.	.	.	.	Frank R. Perrot
Valparaiso, Chile,	.	.	.	.	.	John R. Beaver
Yokohama and Kobe, Japan,	.	.	.	.	.	American Trading Company
Shanghai, China,	.	.	.	.	.	American Trading Company

MINING MACHINERY DEPARTMENT



Scranton Works of Allis-Chalmers Co.
where Ventilating Fans are made.

ALLIS-CHALMERS COMPANY

Allis-Chalmers Company

AIR BRAKES

AIR COMPRESSORS

Steam Driven
Belt Driven
Electrically Driven
Hydraulic Driven

BLOWING ENGINES

CEMENT MACHINERY

Ball Mills
Balls, Forged
Coal Pulverizing Machinery
Crushing Rolls
Elevators
Mixing Pans
Perforated Metals
Revolving Screens
Rock and Ore Breakers
Rotary Dryers
Rotary Kilns
Tube Mills
Tube Mill Linings
Tube Mill Pebbles

CHILLED ROLLS

COAL MINING MACHINERY

Barney Cars
Crusher Rolls
Hoisting Cages
Revolving Screens
Shaking Screens
Ventilating Fans

CONDENSERS

Jet
Barometric

CORLISS ENGINES

CRUSHING MACHINERY

Ballast Plants
Crushing Rolls
Dumping Skips
Gyratory Rock Breakers
Jaw Crushers
Macadam Plants
Perforated Metals
Portable Crushing Plants
Revolving Screens
Quarry Cars
Elevators
Hoists

DREDGES

Gold Dredges
Dipper Dredges
Hydraulic Dredges

ENGINES

Blowing Engines
Corliss Engines
Gas Engines
Hoisting Engines
Pumping Engines
Rocking Valve Engines
Rolling Mill Engines

PRINCIPAL PRODUCTS

FLOUR MILL MACHINERY

Bolters, Universal
Bolting Cloth
Bran and Shorts Brushes
Centrifugal Reels
Corn Mills
Feed Mills
Feed Screens
Flaking Rolls
Flour Packers
Hexagon Reels
Purifiers
Roll Corrugating
Roller Mills
Rolling Screens
Scalping Reels
Sieve Scalpers

GAS ENGINES

HOISTING ENGINES

HYDRAULIC MACHINERY

Water Turbines
Turbine Governors

MINING MACHINERY

Air Compressors
Boiling Tanks
Chilian Mills
Chlorination Plants
Concentrating Plants
Copper Converting Plants
Crushing Plants
Cyanide Plants
Frue Vanners
Gold and Silver Mills
Gold Dredging Machinery
Gyratory Breakers
Hancock Jigs
Hoisting Machinery
Horse Whims
Huntington Mills
Jaw Crushers
Lead Refining Plants
Lixivation Plants
Mining Cages
Mining Cars
Mine Ventilating Machinery
Ore Buckets
Ore Cars
Ore Feeders
Overstrom Concentrators
Prospecting Mills
Roasting Furnaces
Skips
Smelting Machinery
Stamps, Gravity
Stamps, Steam
Stamps, Atmospheric
Stamp Shoes, and Dies
Tramways
Tube Mills, Wet and Dry

PERFORATED METALS

POWER TRANSMISSION MACHINERY

Belt Tighteners
Boxes
Couplings
Gears
Hangers
Pulleys
Rope Sheaves
Shafting

PUMPING MACHINERY

"High Duty" Pumping Engines
Centrifugal Pumps
Elevator Pumps
Fire Service Pumps
Geared Pumps
Hydraulic Transmission Pumps
Mine Pumps
Multi-Stage, High Lift Centrifugal Pumps
Screw Pumps

ROLLING MILL ENGINES

SUGAR MACHINERY

SAW MILL MACHINERY

Band Mills, Double Cutting
Band Mills, Single Cutting
Band Re-saws, Horizontal
Board Lifters, Steam
Cant Flippers, Steam
Canting Machine, Overhead
Circular Saw Mills
Conveying Machinery
Cutting Off Saws, Steam Feed
Edgers
Edging Grinders
Feeds, Steam, Direct Acting
Feeds, Steam, Twin Engine
Filing Room Tools
Lath Mills and Bolters
Live Rolls and Drives
Log Chains
Log Jacks
Log Loaders
Log Turners
Niggers, Steam
Rocking Valve Engines
Saw Mill Carriages
Set Works
Slashers
Steam Feed Valves
Stock Lifters, Steam
Transfers and Transmission
Trimmers

STEAM SHOVELS

TIMBER PRESERVING MACHINERY

TURBINES—STEAM

TURBINES—WATER

ELECTRICAL APPARATUS.

Alternating Current Generators and Motors.

Belted type generators	Synchronous Frequency Changers	Induction Motor-Generator Sets	Transformers
Engine type generators	Induction Motor Frequency Changers	Synchronous Motors	Rotary Converters
Fly-wheel type generators	Synchronous Motor-Generator Sets	Induction Motors	Turbo-Generators
Water-wheel type generators			

Direct Current Generators and Motors.

Belted type motors and generators	Small multipolar motors and generators	Complete Bullock Teaser Equipments for Print.
Engine type generators	Small Bipolar and multipolar motors and generators	ing Presses
Railway generators		Multiple Voltage Balancing Sets
	Street Car Equipments, Motors, Controllers, Etc.	Multiple Voltage Variable Speed Equipments

Switchboards for Direct Current and Alternating Current.